

King's Canterbury 16+ solutions 2014

- 1) a) i) 3.202174593
 ii) 3.20
 b) 1.17×10^{10}
- 2) $0.38 \times 10^{-1}, 3800 \times 10^{-4}, 0.038 \times 10^2, 380$
- 3) a) x^{10}
 b) m^{12}
 c) $\frac{3f^6}{a^4}$
- 4) a) 12
 b) 36
- 5) a) $5x+4y+5$
 b) $3x(3x-2y)$
 c) $4x+8$
 d) $x^2 - 2x - 15$
- 6) a) £780
 b) 15%
 c) £119.44
- 7) $\frac{2x-3}{x+1}$
- 8) a) $-3+6n$
 b) Let $-3 + 6n = 150$ then $n=25.5$, so 150 isn't in the sequence. Or observe that all terms are odd.
- 9) 4.9×10^{-5}
- 10) $x = 3, y = -2$
- 11) $\frac{7}{25}$
- 12) $x = \frac{12}{13}$
- 13) 3.52m
- 14) $t = \frac{2d-7}{6}$
- 15) a) i) $(x - 9)(x - 3)$
 ii) $x = 9$ or 3
 b) $(y - 10)(y + 10)$
- 16) A rotation of 180 degrees around $(-1,0)$
- 17) £414.96
- 18) $1 + \sqrt{5}$
- 19) $ADC = \frac{y}{2}$ (angle at the circumference is half the angle at the centre)
 $ABC = 180 - \frac{y}{2}$ (opposite angles in a cyclic quadrilateral add to 180)
- 20) a) $x=4$
 b) $\frac{\tan\theta-15}{(\tan\theta+3)(\tan\theta-6)}$
- 21) Water meter for a year: $28.20 + (180 \times 365) \times \left(\frac{0.9122}{1000}\right) = £88.13$
 So it is better to have a water meter as this is cheaper than £107 per year.
- 22) $\frac{x-5}{x-7}$

- 23) 14.4cm
- 24) 28.25 minutes, or 28 minutes and 15 seconds
- 25) 16.5cm
- 26) $x=-0.87, y=2.87$
 $x=2.87, y=-0.87$
- 27) $\frac{111}{190}$
- 28) 29.3cm^2